



H04M3/42

H04M3/54

(12) **UK Patent Application** (19) **GB** (11) **2 198 910 A** (13)  
(43) Application published 22 Jun 1988

(21) Application No 8718490

(22) Date of filing 5 Aug 1987

(30) Priority data

(31) 61/298876 (32) 17 Dec 1986 (33) JP  
61/298877 17 Dec 1986  
61/298878 17 Dec 1986

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(51) INT CL<sup>4</sup>

H04M 3/42

(52) Domestic classification (Edition J):

H4K FD

(56) Documents cited

GB A 2122846 US 4313035

(58) Field of search

H4K

Selected US specifications from IPC sub-class  
H04M

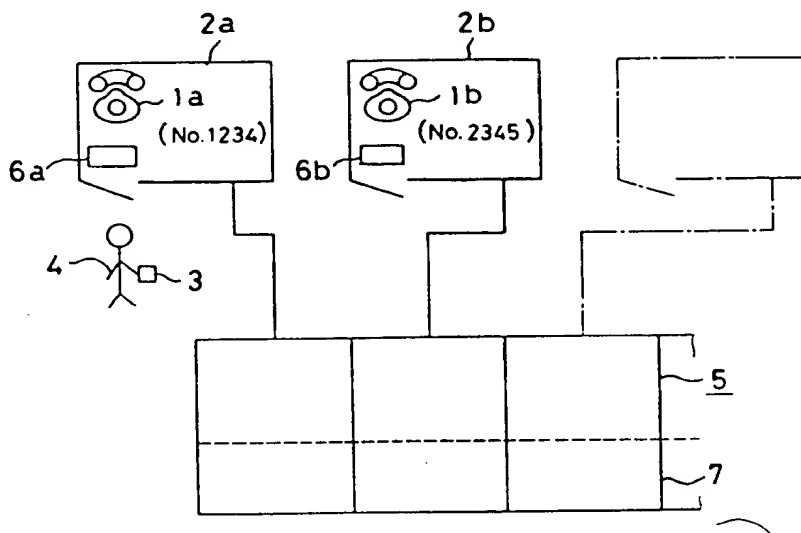
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(54) Telephone exchange system

(57) The telephone exchange system comprises an individual card having a personal code PIN and a memory for coordinating the PIN with the telephone number of a telephone set at which he can be reached. The telephone exchange connects telephone lines according to the PIN written in the memory and the telephone number.

FIG. 1



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FIG. 1

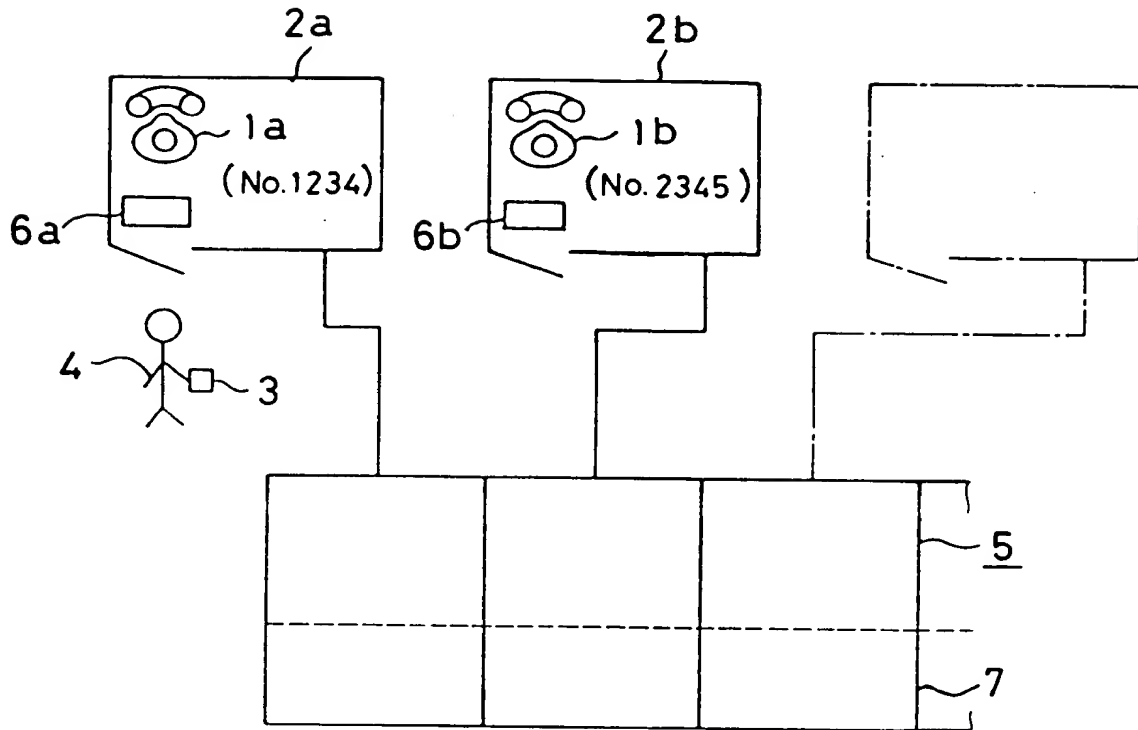
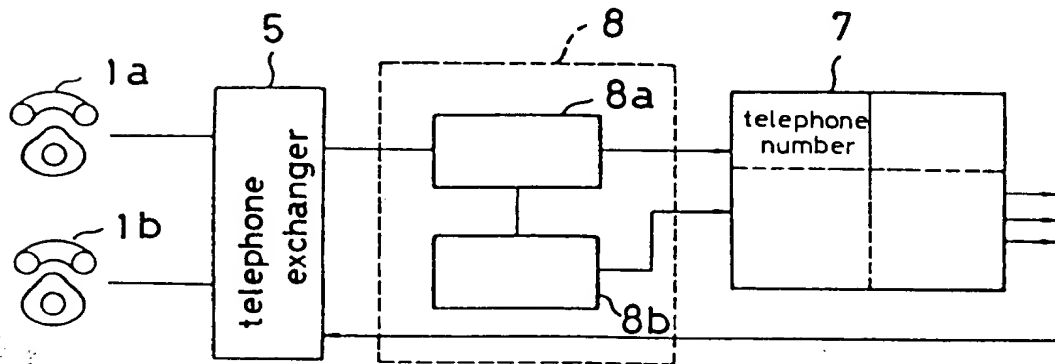


FIG. 2

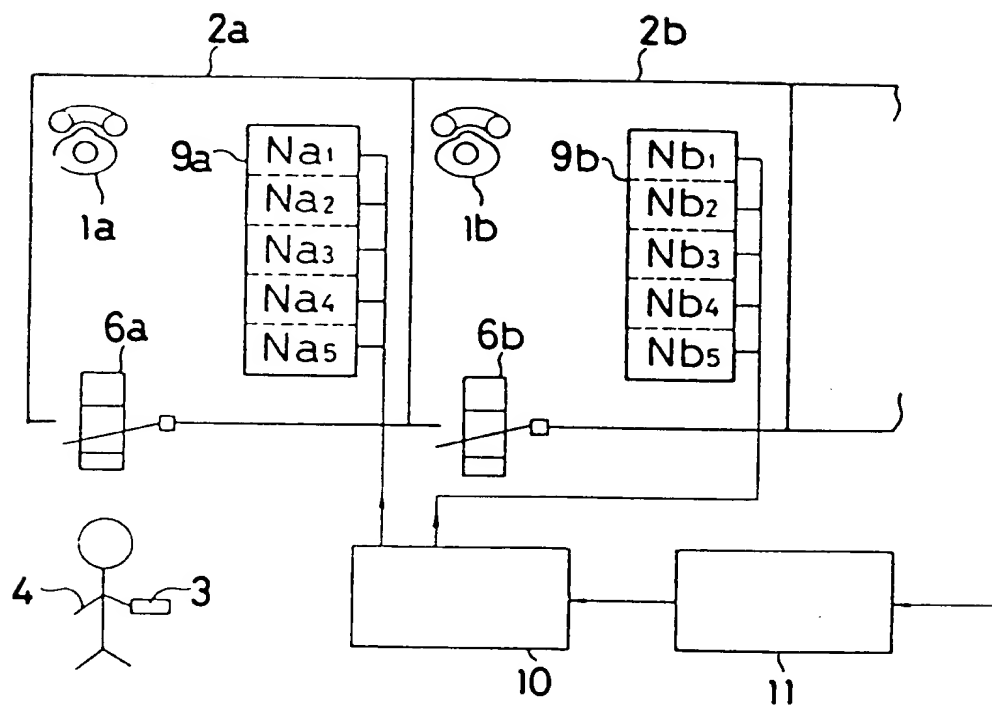




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FIG. 3



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TELEPHONE EXCHANGE SYSTEM

The present invention relates to a telephone exchange system ready for contacting with a called party in a short time.

5           For talking with a specific party on the telephone, the handset of a nearby telephone set will be taken up first, then a hook-switch gets on and the circuit of a telephone exchanger corresponding to the telephone set is turned on. Next from dialing  
10 the telephone number of a telephone set of the party to call, the telephone exchanger receives the dial pulse to select a line of the telephone set of the called party and then connects both telephone sets. Now, he is ready to talk with the called party on  
15 the telephone. In this case where the called party is changeful whereabouts, a repeater may be provided to have the call transferred therethrough. In such case, however, the transfer must be requested every time the called party is not present.

20           In view of the problem mentioned above, the invention provides some improvement whereby an access

time is shortened and a transfer need not be requested when a party to call is not present.

That is, the telephone exchange system according to the invention comprises an individual card  
5 having a personal code, a detection means for detecting an access to the location where the telephone set of a possessor of the individual card is present, and a memory capable of writing and erasing in coordinating the personal code of the detected card  
10 possessor with the telephone number, the telephone exchanger connects telephone lines according to the personal code written in the memory and the telephone number, an access of the possessor of the individual card is detected automatically by the detection means,  
15 and a code number of the card possessor and a telephone number are written in the memory. Then, since the telephone lines are connected according to a data written in the memory, an access time is shortened, and a transfer need not be requested every time the  
20 party to call is not present.

As described above, many people may utilize the telephone set single or plural, a multiplicity of room-to-room telephones are provided, and even in case the user is unspecified, the call can be put  
25 through right to an objective party.



Fig. 1 is a block diagram representing a telephone exchange system given in one embodiment of the invention; Fig. 2 is a block diagram representing the telephone exchanger of Fig. 1 in detail; Fig. 3 is a block diagram representing another embodiment of the invention.

Fig. 1 is a block diagram representing a telephone exchange system given in one embodiment of the invention. Detection means 6a, 6b for detecting an access of a possessor 4 of an individual card 3 having a personal code and transmitting the personal code sent from the individual card 3 and a telephone number (code by rooms) to a telephone exchanger 5 are provided at doorways of rooms 2a, 2b, ... in which telephone sets 1a, 1b, ... are installed. Then, the telephone exchanger 5 is provided with a memory 7 capable of writing and erasing in coordinating the received personal code with the telephone number, and telephone lines of the telephone sets 1a, 1b, ... are connected according to the personal code and the telephone number written in the memory 7. Further, the telephone exchanger 5 is functional as selecting to connection the telephone line corresponding to the telephone number as hitherto.

In the telephone exchange system constructed as above, when the possessor 4 of the individual card 3 comes in the room 2a, for example, the detection means 6a at the doorway detects it, and transmits a personal code of the individual card 3 and a telephone number of the room 2a to the telephone exchanger 5. Upon receipt of the code, the telephone exchanger 5 writes the code in the memory 7 in pairs with the telephone number. In this case, if the telephone number of the telephone set 1a in the room 2a is numbered, for example, 1234, then an address corresponding to No. 1234 of the memory 7 is selected, and the aforementioned personal code is written thereat. Similarly, if a person bearing other individual card comes in the room 2a, a personal code of the individual card is written in the memory 7 at the same address. Then, when the possessor 4 of the individual card 3 shifts to the room 2b from the room 2a, the personal code is written in the memory 7 at the address corresponding to No. 2345, and the personal code written therein at the time when he came in the room 2a is erased concurrently.

Next in case the possessor 4 of the individual card 3 is called on the telephone, a personal code number of the individual card 3 will be dialed. In

this case, the telephone exchanger 5 searches the number of the telephone set in the room for which the personal code of the individual card 3 is written from the memory 7, and selects to connection a line  
5 of the telephone set. The party to call, namely the possessor 4 of the individual card 3 is present in the room with the telephone set installed therein, therefore an access time is shortened, and telephone charges will be saved so much accordingly.

10 As described, a call will not be held in rotation in, for example, a section party telephone within a station yard, therefore a person giving a telephone call will not be kept waiting so long to irritation. Then, since write and erase in the  
15 memory 7 are made automatically according to signals from the detection means 6a, 6b, ..., a transfer need not be requested whenever shifting whereabouts, and a missing from changing whereabouts so often can be prevented.

20 Signals (personal code and code by rooms) are transmitted and received by means of infrared rays, and thus an irradiation range of the light may be controlled to remove an interference with external signals. Then, power battery, light receiving and  
25 emitting elements of the infrared rays, modulator/demodulator circuit and others are incorporated in

the individual card, and its shape is ready for clipping simply on a breast pocket or the like.

As described above, the system is ready for dialing also on the personal code No. other than  
5 normal telephone number, which is so realized by a discriminating means provided on the telephone exchanger 5. That is, Fig. 2 is a block diagram giving a detail thereof, wherein a discriminating means 8 discriminates a telephone set of the number written  
10 in the memory 7 correspondingly to the code number when dialed on the personal code number, thus connecting telephone lines. The discriminating means 8 comprises a discriminating circuit 8a for discriminating whether or not a dial signal inputted to the  
15 telephone exchanger 5 is an object of the call, and another discriminating circuit 8b for discriminating whether or not the call is that on the personal code number.

Meanwhile, Mr. A's code number is fixed before-  
20 hand as, for example, "0001" personally and Mr. B's as "0002", therefore when Mr. A is present where the telephone set 1a (No. 1234) is installed, "9-1234-0001", for example, may be dialed on the telephone set 1a, or a personal code transmitted to the  
25 detection means 6a from the individual card will be detected, thereby transmitting a signal synonymous

with the foregoing "9-1234-0001" to the telephone  
exchanger 5. The discriminating means 8 receives a  
dial signal of the number through the telephone ex-  
changer 5 but decides that the first numeral "9"  
5 indicates not a call but an operation to the memory  
7. Consecutively, an address of the telephone num-  
ber in the memory 7 is set by the next numerals  
"1234", and the personal code number "0001" is written  
thereat. Now, a whereabouts of Mr. A, or his being  
10 present at the position where the telephone set 1a  
is installed is registered.

Next, the case where Mr. A is called on the  
telephone will be described. When Mr. A's code num-  
ber "0001" is dialed through normal operation, the  
15 discriminating means 8 decides that the first numeral  
"0", for example, indicates a call according to the  
personal code number in the dial signal sent from  
the telephone exchanger 5, thus searching in the  
memory 7. If there is the telephone number written  
20 therein correspondingly to the code number "0001",  
then the particular telephone set is selected, and  
a connection command is sent to the telephone ex-  
changer 5.

Then, when Mr. A shifts to a position where the  
25 telephone set 1b numbered "1235" is installed,

"9-1235-0001" will be dialed likewise. Now, Mr. A's personal code number "0001" and the telephone number "1235" are written correspondingly in the memory 7, and the previous number "1234" is erased at the same  
5 time.

As described hereinbefore, when an ordinary telephone number ("1234", for example) is dialed, a connection command for telephone set of the number is given to the exchanger 5, thus working as a nor-  
10 mal exchange system.

Fig. 3 is a block diagram representing another embodiment of the invention. The embodiment is that for which a signal processing circuit for connecting telephone lines upon receipt of a dial signal of the  
15 personal code number written in the memory is provided on each telephone set.

In the drawing, 1a, 1b denote telephone sets installed in rooms 2a, 2b respectively, and signal processing circuits 9a, 9b are provided at every  
20 telephone sets. The signal processing circuits 9a, 9b have a memory capable of writing and erasing the personal code number of the possessor 4 which is sent from the individual card 3, and receive dial signals of the personal code numbers ( $N_{a1}$  to  $N_{as}$ ,  $N_{b1}$  to  $N_{bs}$ )  
25 to connect the telephone sets 1a, 1b. Reference

numerals 6a, 6b represent detection means disposed at doorways of the rooms 2a, 2b respectively, which detect an access of the possessor 4 of the individual card 3. Then, when the possessor 4 enters the rooms  
5 2a, 2b where the telephone sets 1a, 1b are installed, the personal code number is written in memories of the signal processing circuits 9a, 9b each, and when he gets out, the personal code number is erased from the memories. A reference numeral 10 denotes a per-  
10 sonal code calling unit, and 11 denotes a key number booking unit.

The operation will be described next. Persons (on the staff of factory and the like) who have access to the rooms 2a, 2b are furnished with personal  
15 code numbers and possessed of the individual card 3 capable of transmitting a signal of the code number on flashing infrared rays. Then, if the possessor 4 of the individual card 3 having a code number " $Na_1$ ", for example comes in the room 2a, the detection means  
20 6a detects it, and then writes the personal code number " $Na_1$ " in the memory of the signal processing circuit 9a. On the other hand, if a person having the code number " $Na_5$ ", for example, gets out of the room 2a, the detection means 6a detects it, and the  
25 code number " $Na_5$ " is erased from the memory of the

signal processing circuit 9a.

Thus, registration and erasion for persons are carried out at every rooms 2a, 2b, and code numbers written in the memories of the signal processing  
5 circuits 9a, 9b are used as member numbers of the telephone sets 1a, 1b. That is, when a dial signal inputted to the key number booking unit 11 is that to which the personal code number is incidental, memories in the signal processing circuits of the  
10 rooms 2a, 2b are searched through the personal code calling unit 10, and a telephone set in the room registered thereat is selected. For example, a call by the code number "Na<sub>1</sub>" is to ring the telephone set 1a in the room 2a. In this case, the code number  
15 may simply be dialed cosecutively after the key number as described for the call by the personal code number, and thus it can be dialed directly from the line wire. Otherwise, the key number only will be dialed, and then an operator will collate the name  
20 of a called party with the personal code number on a switchboard to redialing. Then, where the code number of the party to be called is not identified in the memories of both signal processing circuits 9a, 9b, the call is returned to the switchboard to the  
25 operator dealing therewith, a busy signal being



repeated, announcing "leaving his seat" to the calling side, and so on.

Claims:

- (1) A telephone exchange system comprising an individual card having a personal code, a detection means for detecting an access to the location where the telephone set of a possessor of the individual card is installed, a memory capable of writing and erasing in coordinating the personal code of the detected card possessor with the telephone number, which is characterized in that the telephone exchanger connects telephone lines according to the personal code written in the memory and the telephone number.
- (2) The telephone exchange system according to claim 1, wherein the memory is provided on the telephone exchanger.
- (3) The telephone exchange system according to claim 1 or 2, wherein the memory is provided on each telephone set.
- (4) The telephone exchange system according to any of claims 1 to 3, wherein the telephone exchanger connects telephone lines even from dialing on the personal code.
- (5) The telephone exchange system according to any of claims 1 to 4, wherein the individual card, the detection means, the memory and the telephone exchanger are intercommunicated through the medium of infrared rays.

(6) A telephone exchange system operable by an individual card having a personal code, comprising detection means for detecting an access to the location where the telephone set of a possessor of the individual card is installed, and a memory  
5 capable of writing and erasing in coordinating the personal code of the detected card possessor with the telephone number, characterized in that the telephone exchanger connects telephone lines according to the personal code written in the memory and the telephone number.

10 (7) A telephone exchange system substantially as hereinbefore described with reference to the accompanying drawings.

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